UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,961	12/04/2003	Gregory D. Durgin	465-012US	7394

22897 7590 10/28/2005

DEMONT & BREYER, LLC
SUITE 250
100 COMMONS WAY
HOLMDEL, NJ 07733

EXAMINER	
MANOHARAN, MUTHUSWAMY GANAPATHY	
ART UNIT	**PAPER NUMBER**
2683	

DATE MAILED: 10/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/727,961	DURGIN, GREGORY D.	
	Examiner	Art Unit	
	Muthuswamy G. Manoharan	2683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-30 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-30 is/are rejected.

7)☒ Claim(s) 30 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 03/07/2005.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Objections

Claim [30] is objected under 37 CFR 1.75 as being a substantial duplicate of claim 29. Claim 30 is nonelected.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The claims 18,19, 24 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The estimation of the signal vector is recited in claims 18 and 24. However, estimation of signal vector is missing from the specification. Clarification and /or correction required.

The recitation of "difference between said surface vector and said signal vector" in claims 19 and 25 is not consistent with that in the specification (Paragraph [0087]). Clarification and /or correction required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 27-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Bahl et al. (hereinafter Bahl) (US 6799047).

Regarding cliam 27, Bahl teaches a method for estimating a location of a wireless terminal, said method comprising: accessing an outdoor radio frequency database, wherein said outdoor radio frequency database provides signal strength as a function of location; and modifying said signal strength, as provided by said outdoor radio frequency database, with signal-attenuation values from an indoor radio frequency database, wherein said indoor radio frequency database provides signal attenuation as a function of location within a structure (col. 9, lines 54-63; Col. 10, lines 25-29).

Regarding claim 28, the method of claim 27 further comprising: receiving a first signal-strength measurement for a first signal at said wireless terminal; and estimating the location of said wireless terminal by pattern matching a function of said first signal-strength measurement against signal-strength data from said outdoor radio frequency database, as modified by said indoor radio frequency database (col. 9, lines 54-63; Col. 10, lines 25-29).

Regarding claim 29, Bahl teaches the method of claim 27 wherein said signal-attenuation values from said indoor radio frequency database are orientation-independent (Col. 6, lines 26-30).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 7-10, and 13-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Bahl et al. (hereinafter Bahl) (US 6799047) in view of Rappaport et al. (US 6850946).

Regarding claim 1, Bahl teaches a method for estimating a location of a wireless terminal (Col. 1, line 67), said method comprising defining a rasterized footprint of a building, wherein said rasterized footprint comprises a plurality of rasters (Col.2, lines 18-19), and wherein said rasterized footprint has a boundary and an interior (Every physical object has a boundary and an interior); and estimating signal attenuation due to said building (Col. 9, lines 50-52), wherein the estimate of signal attenuation is based on signal losses at a first group of said rasters (Col. 2, lines 23-26), wherein said rasters in said first group define said boundary of said rasterized footprint. Bahl did not teach expressly the raster format. However, Rappaport teaches in an analogous art, raster format (Col. 8, line 6-7). Therefore, it would be obvious to one of ordinary skill in the art the time of invention to use the raster format, since raster images could be easily modified (copied, moved or clipped).

Regarding claim 2, Bahl further teaches the method of claim 1 wherein estimating signal attenuation further comprises basing the estimate of signal attenuation

on signal losses at a second group of said rasters (Col. 2, lines 23-26), wherein said rasters in said second group define said interior of said rasterized footprint.

Regarding claim 7, Bahl further teaches the method of claim 2 further comprising developing a map from the estimate of signal attenuation, wherein said map associates location within said building with an indicator of signal attenuation (items 144,160 in Figure 6; Col. 10, lines 25-40)

Regarding claim 8, Bahl further teaches the method of claim 7 further comprising using the signal-attenuation information from said map to adjust signal-strength estimates that are obtained from an outdoor radio frequency database Col. 10, lines 25-40).

Regarding claim 9, Bahl further teaches the method of claim 8 further comprising: receiving a first signal-strength measurement for a first signal at said wireless terminal; and estimating the location of said wireless terminal by pattern matching a function of said first signal-strength measurement against the adjusted signal-strength estimates (Abstract, lines 5-10).

Regarding claim 10, Bahl teaches a method for estimating a location of a wireless terminal (Col. 1, line 67), said method comprising: defining a rasterized footprint of a building, wherein said rasterized footprint comprises a plurality of rasters (Col. 2, lines 18-19), and wherein said rasterized footprint has a boundary and an interior, and further wherein rasters at said boundary of said rasterized footprint define a first group of rasters; and estimating signal attenuation due to said building (Col. 9, lines 50-52), wherein the estimate of signal attenuation is based on signal losses in a second

group of said rasters (Col. 2, lines 23-26), wherein said rasters in said second group are in said interior of said rasterized footprint. Bahl did not teach expressly the raster format. However, Rappaport teaches in an analogous art, raster format (Col. 8, line 6-7). Therefore, it would be obvious to one of ordinary skill in the art the time of invention to use the raster format, since raster images could be easily modified (copied, moved or clipped).

Regarding claim 13, Bahl further teaches the method of claim 10, further comprising; adjusting signal-strength estimates obtained from an outdoor radio frequency database using the estimates of signal attenuation within said building ((Col. 10, lines 24-28).

Regarding claim 14, Bahl further teaches the method of claim 13 further comprising; receiving a first signal-strength measurement for a first signal at said wireless terminal; and estimating the location of said wireless terminal by pattern matching a function of said first signal-strength measurement against the adjusted signal-strength estimates (Col. 2, lines 14-28).

Claims 4,5,6,12,15,20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bahl in view of Rappaport and further in view of Baranger (hereinafter Baranger) (US 6119009).

Regarding claims 4, Bahl in view of Rappaport teaches all the particulars of the claim except for estimating signal attenuation further comprises accounting for an effect of building orientation with respect to a direction of signal propagation on signal losses at said first group of rasters. However, Baranger teaches in an analogus art, a method

of estimating signal attenuation further comprises accounting for an effect of building orientation with respect to a direction of signal propagation on signal losses at said first group of rasters (Col. 4, lines 47-49). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to include the method of estimating signal attenuation further comprises accounting for an effect of building orientation with respect to a direction of signal propagation on signal losses at said first group of rasters so as to achieve an accurate estimate of the location of the wireless terminal.

Regarding claims 5 and 6, Bahl in view of Rappaport teaches all the particulars of the claim except for estimating signal attenuation further comprises accounting for an effect of building orientation with respect to a direction of signal propagation on signal losses at said second group of rasters. However, Baranger teaches in an analogus art, a method of estimating signal attenuation further comprises accounting for an effect of building orientation with respect to a direction of signal propagation on signal losses at said second group of rasters (Col. 4, lines 47-49). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to include the method of estimating signal attenuation further comprises accounting for an effect of building orientation with respect to a direction of signal propagation on signal losses at said second group of rasters so as to achieve an accurate estimate of the location of the wireless terminal.

Regarding claims 12, Bahl in view of Rappaport teaches all the particulars of the claim except for the method of claim 10 wherein estimating signal attenuation further comprises accounting for an effect of building orientation with respect to a direction of signal propagation on signal losses at said second group of rasters. However, Baranger

teaches in an analogus art, a method of estimating signal attenuation further comprises accounting for an effect of building orientation with respect to a direction of signal propagation on signal losses at said second group of rasters (Col. 4, lines 47-49). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to include the method of estimating signal attenuation further comprises accounting for an effect of building orientation with respect to a direction of signal propagation on signal losses at said second group of rasters so as to estimate the signal attenuation when the signal direction is not along the direction of the normal to the boundary of the building.

Regarding claim 15, Bahl in view of Rappaport teaches all the particulars of the claim except estimating signal attenuation due to said building, wherein the estimated signal attenuation is a function of an angle of incidence of a signal with respect to one or more physical features of said building, wherein said signal is transmitted from a transmitter. However, Baranger teaches in an analogous art, estimating signal attenuation due to said building, wherein the estimated signal attenuation is a function of an angle of incidence of a signal with respect to one or more physical features of said building, wherein said signal is transmitted from a transmitter (Col. 4, lines 47-49). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to include the method of estimating signal attenuation due to said building, wherein the estimated signal attenuation is a function of an angle of incidence of a signal with respect to one or more physical features of said building, wherein said signal is transmitted from a transmitter. This would help in estimating the signal attenuation when

the signal direction is not along the direction of the normal to the boundary of the building.

Regarding claim 20, Bahl further teaches the method of claim 15 further comprising; assigning an attenuation value to a raster at said boundary as a function of said angle of incidence of said signal (Col. 6, lines 27-30).

Regarding claim 21, Bahl in view of Rappaport teaches all the particulars of the claim except the losses are a function an angle of incidence of a signal with respect to said building. However, Baranger teaches in an analogous art, teach expressly losses are a function an angle of incidence of a signal (Col. 4, lines 47-49) with respect to said building. Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to express the losses are a function an angle of incidence of a signal with respect to said building. . This would help in estimating the signal attenuation when the signal direction is not along the direction of the normal to the boundary of the building.

Claims 16-19 and 22, and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bahl, in view of Rappaport and further in view of Baranger and further in view of Egbert et al. (IEEE Computer graphics and applications, July 1996).

Regarding claims 16-17, 22 and 26, Bahl in view of Rappaport and further in view of Baranger, teaches all the particulars of the claim except for method of estimating a surface vector of a raster at said boundary. However, Egbert teaches in an analogous art, method of estimating a surface vector of a raster at said boundary (Page 21, line 5-7). Therefore, it would be obvious to one ordinary skill in the art at the time of invention to include a method of estimating a surface vector of a raster at said boundary. This

method of estimation by averaging will be useful when the surface is not smooth. Also, finding a surface vector of a surface is well known in the field of "vector analysis".

Regarding claims 18,19,24 and 25, Bahl further teaches estimating signal attenuation further comprises determining a difference between said surface vector and said signal vector (Col.6, lines 26-30). Also finding a difference between two vectors is well known in the field of vector analysis.

Regarding claim 26, Bahl further teaches; assigning an attenuation value to a raster at said boundary as a function of said angle of incidence of said signal (Col. 6, lines 26-30).

Claims 3, 11, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Bahl et al. (hereinafter Bahl) (US 6799047) in view of Rappaport et al. (US 6850946), and further in view of Bahl et al. (IEEE INFOCOM 2000).

Regarding claim 3, and 11 and Bahl in view of Rappaport teaches all the particulars of the claim, except for the method further comprising determining a depth of said raster within said interior, wherein said depth of said raster is defined by a layer number, L, wherein rasters defining said boundary have a layer number, L=1; wherein rasters defining said interior have a layer number L = 2 to n, wherein n is a positive integer; and wherein signal attenuation at layer L= m, wherein $m \geq 2$, is based on the signal losses at layers L = 1 through m –1. However, Bahl teaches in an analogous art, the method further comprising determining a depth of said raster within said rasterized footprint, wherein said depth of said raster is defined by a layer number, L; wherein rasters defining said boundary have a layer number, L=1; wherein rasters defining said

interior have a layer number L = 2 to n, wherein n is a positive integer; and wherein signal attenuation at layer L= m, wherein m ≥ 2, is based on the signal losses at layers L = 1 through m –1 (Page 779, section 4.1.2, lines 1-16 and also Figure 4). Therefore, it would be obvious to one ordinary skill in the art at the time of invention to include the method further comprising determining a depth of said raster within said rasterized footprint, wherein said depth of said raster is defined by a layer number,L; wherein rasters defining said boundary have a layer number, L=1; wherein rasters defining said interior have a layer number L = 2 to n, wherein n is a positive integer; and wherein signal attenuation at layer L= m, wherein m ≥ 2, is based on the signal losses at layers L = 1 through m –1. This inclusion provides an empirical method of computing the location estimation where the local changes in environment could be easily adapted.

Regarding claim 23, and Bahl in view of Rappaport teaches all the particulars of the claim, except for the method further comprising determining a depth of said raster within said interior, wherein said depth of said raster is defined by a layer number, L, wherein rasters defining said boundary have a layer number, L=1; wherein rasters defining said interior have a layer number L = 2 to n, wherein n is a positive integer; and wherein surface vector of raster at layer L= m, wherein m ≥ 2, is based on the signal losses at layers L = 1 through m –1. However, Bahl teaches in an analogous art, the method further comprising determining a depth of said raster within said rasterized footprint, wherein said depth of said raster is defined by a layer number, L; wherein rasters defining said boundary have a layer number, L=1; wherein rasters defining said interior have a layer number L = 2 to n, wherein n is a positive integer; and wherein

surface vector of raster at layer L= m, wherein m ≥ 2, is based on the signal losses at layers L = 1 through m –1 (Page 779, section 4.1.2, lines 1-16 and also Figure 4). Therefore, it would be obvious to one ordinary skill in the art at the time of invention to include the method further comprising determining a depth of said raster within said rasterized footprint, wherein said depth of said raster is defined by a layer number,L; wherein rasters defining said boundary have a layer number, L=1; wherein rasters defining said interior have a layer number L = 2 to n, wherein n is a positive integer; and wherein surface vector of raster at layer L= m, wherein m ≥ 2, is based on the signal losses at layers L = 1 through m –1. This inclusion provides an empirical method of computing the location estimation where the local changes in environment could be easily adapted.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Muthuswamy G. Manoharan whose telephone number is 571-272-5515. The examiner can normally be reached on 7:30AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WILLIAM TROST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600